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## **SURVEY TRANSMITTALS**

Transmitting accurate and consistently formatted survey data to the designer will facilitate an efficient and economical project design. Regardless of the survey method (i.e., electronic or conventional), the electronic survey files that are submitted to INDOT must be in a MOSS format that is consistent with the Department's string label conventions. If the survey is for a consultant's CADD system, then the files may be transmitted in a DXF format. A complete survey transmittal should incorporate all relevant survey information, whether electronic or not.

This chapter presents the style and format of survey transmittals that are acceptable to the Department. The guidelines and procedures that are presented in this chapter also cover the types of files and the documentation formats that should be utilized in project design.

### ***26-1.0 GUIDELINES AND PROCEDURES***

#### **26-1.01 Conventional Engineering Survey Data**

Although conventional engineering surveys are permitted by the Department, the survey data still must be transmitted to INDOT as electronic files in a MOSS format that is consistent with the Department's string label conventions. The continuity of strings and labels is very important. Depending on the software, it may be necessary to concatenate strings to ensure that a particular feature is continuous.

The original survey field notes must be submitted to the Department. Standard field notes should be submitted in a standard survey field book.

#### **26-1.02 Electronic Collection Survey Data**

Many different types of formats exist for the data collected by an electronic survey. The following sections discuss the two formats that are acceptable for use on INDOT projects and the circumstances under which each may be utilized.

### **26-1.02(01) MOSS Format**

If electronic survey data is collected by the Department or collected by others and transmitted to the Department for use by INDOT design personnel, the electronic data must adhere to one of the following MOSS file formats.

1. GENIO File Format. The GENIO (i.e., general input/output) format is based on an ASCII (i.e., text) file that contains a specific number and type of data fields. Most of the existing survey and CADD software packages have the ability to accommodate this file format. GENIO files can be directly input into MOSS without much difficulty.
2. Model File Format. The model file format is a binary file format that can be directly input into MOSS without conversion. The MOSS model file format is preferred by the Department.

### **26-1.02(02) DXF Format**

The DXF (i.e., data exchange) format is an industry standard data interchange format that can be utilized with most of the existing CADD systems. The DXF file format is typically used by consultants that cannot accommodate the MOSS file format. The following DXF files are necessary for project design.

1. Topography File. All planimetric information that is layered according to the Department's string label conventions is contained in the DXF topography file.
2. Contour File. The DXF contour file contains the survey data at 0.2-m contour intervals. Predominant contours are identified at 1-m intervals.
3. Triangulation File. A listing of the strings (or layers) not to be used in triangulation of the ground model.

### **26-1.03 Other Survey Information**

A complete survey transmittal contains other important survey information that is relevant to the project. The following list presents the items that should be included.

1. Survey Envelope Contents. The survey envelope should be a 229-mm x 305-mm manila envelope. It should only contain the following items.

- a. interview sheets, and
- b. section plats.

All other information should be packaged in a separate envelope and submitted with the completed survey.

Figure 26-1A, Survey Envelope Label, illustrates how the survey envelope should be labeled. The outside of the survey envelope should contain the following information.

- a. route number - location description (i.e., as it appears on the schedule sheet);
  - b. project designation (i.e., Des) number;
  - c. project number;
  - d. structure number, if applicable;
  - e. county;
  - f. date;
  - g. survey crew; and
  - h. envelope contents.
2. Survey Field Books. The survey field books should be submitted with the final survey materials.
3. Miscellaneous Envelope. See Figure 26-1B, Miscellaneous Envelope. The miscellaneous envelope should be placed in the back of the survey book and should contain the following items.
- a. copies of section plats,
  - b. photographs, and
  - c. section corner reference cards.
4. Section Corner Reference Cards. See Figure 26-1C, Section Corner Reference Card. These cards should be placed in the miscellaneous envelope in the back of the field book (101 mm x 152 mm).
5. Section Plats. The original section plats should be placed in the survey envelope. One copy of each original should be placed in the miscellaneous envelope in the back of the field book.
6. Interview Sheets. The interview sheets should be placed in the survey envelope.
7. Property Deeds. All property deeds that are within the project survey limits and those deeds which appear necessary for other reasons should be acquired by the survey crew.

Property deeds should be submitted with the field survey and forwarded to Land Acquisition.

8. Subdivision Plats. All subdivision plats should be placed in an envelope that is submitted to the Department. See Section 26-1.03, Item 1.
9. Town Plats. Town plats also should be placed in an envelope and submitted to the Department. See Section 26-1.03, Item 1.
10. Route Plats. Route plats are required for any INDOT project that requires the purchase of right-of-way. They are required for any survey started after December 31, 1991. This follows the Standards for Surveying in Indiana (Rule 12) as promulgated by Indiana Administrative Code 865. A copy of the recorded location control route survey plat is required for the use by Land Acquisition. It should be submitted on an A1 size (i.e., 841 mm x 594 mm) mylar sheet (see Section 14-3.03) and should already have been recorded if the survey is done by a consultant. Otherwise, if the survey is conducted by INDOT, the location control route survey plat will be sent to the Land Acquisition Division for recording. See Figure 26-1E, Location Control Route Survey Plat Example. The following guidelines are intended to aid in putting together a plat to comply with IAC 865, but is not intended to replace the surveyor's judgement as to what should appear on his/her own survey:
  - a. Draw the location control route survey plat (herein referred to as "plat") on an A1 size (i.e., 841 mm x 594 mm) mylar sheet (see Section 14-3.03) to be included in the plans. However, the plat will probably need to be reduced to an A3 (i.e., 420 mm x 297 mm) size (see Section 14-3.03) for recording. Keep this in mind when choosing font sizes and line thickness. Also, include a .DXF electronic file on diskette for submission.
  - b. Indicate the scale along with a graphical representation. INDOT typically uses a 1:2500 relative scale. This produces a single plat that enables sufficient space to include the surveyor's report for a project of about 800 m in length.
  - c. Indicate the location of the project by labeling the roads on the plat. If no intersecting roads are within the project, then include a description for the location in the surveyor's report.
  - d. Make note in the surveyor's report as to the units used on the plat. If no units are given, the assumed system will be metric. All distances will follow the metrication guide for INDOT. Any dimension with a decimal point will be assumed to be meters. If no decimal point is specified, then millimeters will be assumed.

- e. Show all edges of pavement, fences, centerline points found or set, approximate locations of apparent property lines, buildings, etc. INDOT is currently using a separate plat for the field and office plat. For the field plat, showing any right-of-way is not required. Only physical evidence of right-of-way is shown. In addition, the property lines shown on the field plat are for graphical representation only. They are not intended for a property retracement and are not necessarily to scale.
  - f. Indicate all centerline points and reference baseline points set. The stationing used on centerline should be shown and the basis of the stationing indicated in the surveyor's report. All section corners should also be indicated on the plat graphically where feasible (due to scale considerations). All points should have references drawn according to the type of monument (e.g., centerline, section corner, subdivision corner, property corner). Typically, the arrow for a centerline point indicates the direction of the alignment and for any section corners the arrow usually indicates the direction for north. This should be noted in the reference boxes; see Figure 26-1E, Location Control Route Survey Plat Example.
  - g. Indicate as to whether the monument was found or set and include a complete description in the surveyor's report. This should include the size, type of monument, vertical description (e.g., flush, buried, protruding), location to physical features around the monument, origin (if known), uncertainty, etc.,.
  - h. The location of the monument can be given by an angle and distance, station and offset, or by some coordinate system. Coordinates should be reproducible with the information given on the plat. Include all necessary information so that this may be accomplished. INDOT currently uses an assumed coordinate system for its plats. Coordinates are provided in the reference boxes to tie any monuments to the coordinated system on the plat. This is the preferred method at INDOT.
  - i. Show owner's names on the plat at the time of the survey.
  - j. Include all title block information known at the time the plat is transmitted to the Land Acquisition Division.
11. Recorded Plats. The recorded surveys that were obtained from the recorders office should be submitted with the survey.
12. Plans. Any copies of plans that have been obtained from the central office vault, district office or other sources should also be submitted to the Department.

13. Computer Diskettes. Computer diskettes should be included with the materials contained in the separate envelope. Figure 26-1D, Computer Diskette Labels, illustrates an example of how to label the diskettes. Some kind of label program will be used to make the label. Do not submit a hand-written label. The text on the label will be the Arial Font and a point size of 10. The orientation of the label will be as shown in Figure 26-1D.